

REMARKS

In response to the Office Action mailed November 18, 2005, Applicants respectfully request reconsideration of the Application in view of the foregoing Amendments and the following Remarks. The claims as now presented are believed to be in allowable condition.

Claims 4-5 and 13-25 have been canceled, and claims 1 and 3 have been amended.

Claims 1-3 and 6-12 remain in this application, of which claim 1 is an independent claim.

Claims 26-34 have been newly added of which claim 26 is an independent claim.

Rejection under 35 USC §112

Claim 13 is rejected under 35 USC §112, second paragraph. Claim 13 is canceled.

Rejection of Claims 1-6 and 8-12 under 35 U.S.C. §103(a)

Claims 1-6 and 8-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,420,097 to Pike et al. (hereafter referred to as “Pike”) in view of U.S. Patent No. 6,936,539 to Yin et al. (hereafter referred to as “Yin”). Applicants respectfully traverse this rejection.

The rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Pike in view of Yin is not appropriate because claim 1 has been amended and a *prima facie* case of obviousness cannot be established for such amended claim 1.

In giving an obviousness rejection, the Examiner bears the initial burden of factually supporting a *prima facie* conclusion of obviousness. (See, MPEP, §2142). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be *some suggestion or motivation*, either in the references themselves or in the knowledge generally available to one

of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art references* must teach or suggest *all the claim limitations*. (See, MPEP, §2142.) (Emphasis added.)

The rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Pike in view of Yin is not appropriate because *inter alia* these prior art references fail to teach or suggest all the claim limitations of amended claim 1 and because there is no motivation or suggestion in these references to combine or modify these references to the present invention.

Amended claim 1 recites the step of *trimming together* the rigid organic mask structure *and* the photo-resist mask structure to lower together a respective critical dimension of each of the rigid organic mask structure and the photo-resist mask structure.

Support for such a limitation is found at the embodiment for Figs. 7 and 9 and the corresponding description of the Patent Application. Referring to the embodiment of Figs. 7 and 9 of the Present Application, the photo-resist mask structure 222 *and* the rigid organic mask structure 228 are *together trimmed* to the smaller final critical dimension 232 from the larger initial critical dimension 230.

In contrast, referring to Figs. 4c and 4d of Pike, only the hard-mask 126 is trimmed. Pike *teaches away* from trimming the photo-resist structure 122 by touting etch selectivity between the hard-mask 126 and the photo-resist 122 such that the photo-resist 122 is sure to remain on the hard-mask at col. 4, lines 24-29 of Pike:

....The hardmask 126 has a final linewidth 128 *which is smaller* than the initial linewidth 124 of the resist mask 122 and corresponds approximately to the desired gate or structure linewidth. *By leaving the resist mask 122 during the hardmask trim*, there is prevented the loss of material from the top of the hardmask 126.
(Emphasis Added.)

By touting such etch selectivity, Pike teaches away from *trimming together* the rigid organic mask structure *and* the photo-resist mask structure.

Furthermore, referring to Figs. 6 and 8 of Yin, Yin is directed to patterning a hole through the dielectrics 34 and 26. Thus, Yin is not concerned with minimizing the critical dimension of any structure formed underneath the remaining rigid organic mask structure. Thus, Yin does not even remotely suggest *trimming together* the rigid organic mask structure *and* the photo-resist mask structure.

If the Examiner disagrees, the Examiner is respectfully requested to point out *the exactly location*, including *specific column(s), line number(s), and/or figure element(s)* in Pike and/or Yin, that teaches all of the limitations of amended claim 1.

The MPEP at §2141.02 states “the prior art must be considered in its entirety, including disclosures that teach away from the claims.”

Accordingly, a prima facie conclusion of obviousness of claim 1 cannot be established because Pike and/or Yin fail to teach all of the limitations of claim 1 and even teach away from such limitation. Thus, the rejection of claim 1 under 35 U.S.C. §103(a) should be withdrawn.

Claims 4-5 have been canceled.

Claims 2, 3, 6, and 8-12, which depend from and further limit claim 1, are allowable for at least the same reasons that claim 1 is allowable as stated above.

Rejection of Claims 7 and 13 under 35 U.S.C. §103(a)

Claim 7, which depends from and further limits claim 1, is allowable for at least the same reasons that claim 1 is allowable as stated above.

Claim 13 has been canceled.

Newly Added Claims 26-34

Claims 26-34 have been newly added with claim 26 being an independent claim and claims 27-34 being dependent from claim 26.

Claims 26-34 are believed to be allowable, especially over Pike and Yin. Claim 26 recites the step of trimming the rigid organic mask structure to lower a critical dimension of the rigid organic mask structure with the photo-resist mask structure being completely etched away during such a trimming step.

Support for such a limitation is found at the embodiment for Figs. 7 and 8 and the corresponding description of the Patent Application. Referring to the embodiment of Figs. 7 and 8 of the Present Application, the photo-resist mask structure 222 is *completely* etched away during trimming of the rigid organic mask structure 228 to the smaller final critical dimension 232 from the larger initial critical dimension 230.

In contrast, referring to Figs. 4c and 4d of Pike, only the hard-mask 126 is trimmed. Pike *teaches away* from etching away the photo-resist structure 122 at col. 4, lines 24-29 of Pike:

....The hardmask 126 has a final linewidth 128 which is smaller than the initial linewidth 124 of the resist mask 122 and corresponds approximately to the desired gate or structure linewidth. *By leaving the resist mask 122 during the hardmask trim*, there is prevented the loss of material from the top of the hardmask 126.
(Emphasis Added.)

Additionally, Yin touts being able to completely etch away both the DARC layer 60 and the photoresist layer 38 together at col. 5, lines 50-55 of Yin:

The embodiments described above allow for an improved *removal* of an antireflective coating through the use of a material (a-C:B) which can be ashed *along with the photoresist layer* rather than requiring removal through the use of an acid or a dry etch which can damage BPSG, TEOS, or other dielectric.
(Emphasis added.)

Thus, Yin does not even remotely teach trimming the DARC layer 60 to having a remaining DARC structure after the photoresist layer 38 is completely removed. Rather, Yin touts completely removing the DARC layer 60 and the photoresist layer 38 together.

If the Examiner disagrees, the Examiner is respectfully requested to point out *the exactly location*, including *specific column(s), line number(s), and/or figure element(s)* in Pike and/or Yin, that teaches all of the limitations of new claim 26.

The MPEP at §2141.02 states “the prior art must be considered in its entirety, including disclosures that teach away from the claims.”

Claims 27-34, which depend from and further limit claim 26, are believed to be allowable for at least the same reasons that claim 26 is believed to be allowable as stated above.

Informal Declaration under 37 CFR §1.131

Attached hereto is an informal declaration under 37 CFR §1.131. Such a declaration is informal because not every inventor has signed the informal declaration since Applicants believe that the pending claims will be allowable from the Remarks above.

The informal declaration has been signed by the first named inventor, Christopher Lyons, and attached as Exhibit A is a copy of the Invention Disclosure Form describing the subjected matter recited in the pending claims. The document provides factual evidence that the subject matter as recited in the pending claims was conceived and/or reduced to practice on or before January 22, 2003.

Such a date is before the filing date for U.S. Patent No. 6,936,539 to Yin et al. (September 24, 2003), U.S. Patent No. 6,939,794 to Yin et al. (June 17, 2003), and U.S. Patent No. 6,933,227 to Adetutu et al. (October 23, 2003).

Thus, if the Examiner still finds our Remarks unconvincing, a formal declaration under 37 CFR §1.131 to remove such references as prior art may be filed by acquiring the signatures of all of the inventors.

Conclusions

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. Please feel free to contact the undersigned should any questions arise with respect to this case that may be addressed by telephone.

Respectfully submitted,
for the Applicant(s)

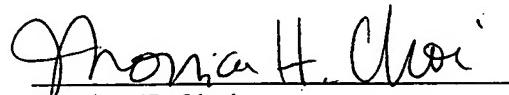
Dated: January 24, 2006

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CERTIFICATE OF MAILING

The undersigned hereby certifies that the foregoing AMENDMENT AND RESPONSE is being deposited in the United States Postal Service, as first class mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 24th day of January, 2006.


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